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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,966	01/28/2004	Shou-Tsung Wang	MTKP0034USA	1965

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NORTH AMERICA INTELLECTUAL PROPERTY CORPORATION
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EXAMINER	
NGUYEN, TUAN HOANG	
ART UNIT	**PAPER NUMBER**
2618	

DATE MAILED: 05/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/707,966	WANG ET AL.	
	Examiner	Art Unit	
	Tuan H. Nguyen	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/28/04 & 4/6/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 01/28/2004 and 04/06/2005 has been considered by Examiner and made of record in the application file.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability sDarabi not be negatived by the manner in which the invention was made.

4. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gu (US PUB. 2003/0072393) in view of Darabi et al. (U.S PAT. 6,968,019 hereinafter, "Darabi").

Regarding claim 1, Gu discloses an analog demodulator used in a low-IF receiver, the analog demodulator comprising: a receiving circuit for receiving in-phase IF (intermediate frequency) signals and quadrature-phase IF signals (page 2 [0032]); a reference source for providing a reference clock (page 3 [0040]); a local oscillator signal generator electrically connected to the reference source for transferring the frequency of the reference clock to a predetermined frequency (page 3 [0040]); and at least one mixer electrically connected to the local oscillator signal generator (page 2 [0032]). Gu differs from the claimed invention in not specifically teaching at least one first calibration device for reducing DC components of the in-phase IF signals and the quadrature-phase IF signals; and the at least one first calibration device for processing the pair of quadrature signals. However, Darabi teaches at least one first calibration device for reducing DC components of the in-phase IF signals and the quadrature-phase IF signals (Fig. 1 col. 3 lines 15-30); and the at least one first calibration device for processing the pair of quadrature signals (col. 3 lines 15-30). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Gu for at least one first calibration device for reducing DC components of the in-phase IF signals and the quadrature-phase IF signals; and the at least one first calibration device for processing the pair of quadrature signals, such that it provides a low-power, and high performance receiver including an IF demodulator for high data rate, frequency modulated systems, such as Bluetooth. The IF demodulator is implemented in analog domain for

simplicity and lower power consumption and operates at an IF frequency as taught by Darabi.

5. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gu (US PUB. 2003/0072393) in view of Darabi et al. (U.S PAT. 6,968,019 hereinafter, "Darabi") as applied to claim 1 above, and further in view of Wu et al. (U.S PAT. 6,987,966 hereinafter, "Wu").

Regarding claim 2, Gu and Darabi, in combination, fails to discloses each of the first calibration devices comprises a notch filter or a high pass filter. However, Wu teaches each of the first calibration devices comprises a notch filter or a high pass filter (col. 48 lines 62-63 claim3). Therefore, it is obvious to one of ordinary skill in the art at the time the invention was made to incorporate the disclosing of Wu into view of Gu and Darabi, in order to provide full integration of the transceiver onto a single IC for a low cost, low power, reliable and more compact solution. This can be achieved by moving external bulky and expensive image reject filters, channel select filters, and baluns onto the RF chip; reducing the number of off-chip passive elements such as capacitors, inductors, and resistors by moving them onto the chip; and integrating all the remaining components onto the chip.

Regarding claim 3, Wu further discloses at least one second calibration device electrically connected to the corresponding mixer for reducing DC offset

generated by the mixer (col. 25 lines 19-22).

Regarding claim 4, Wu further discloses each of the second calibration devices comprises a controllable current mirror, wherein the controllable current mirror is used to transform the in-phase IF signals and the quadrature-phase IF signals into corresponding current signals and to adjust a bias current in an input circuit of the mixer equal to the corresponding current signals for reducing LO leakage generated when the in-phase IF signal and the quadrature-phase IF signal pass the mixer (col. 46 lines 51-67).

6. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gu (US PUB. 2003/0072393) in view of Wu et al. (U.S PAT. 6,987,966 hereinafter, "Wu").

Regarding claim 5, Gu discloses an analog demodulator used in a low-IF receiver, the analog demodulator comprising: a receiving circuit for receiving a pair of quadrature signals (page 2 [0032]); a reference source for providing a reference clock (page 3 [0040]); a local oscillator signal generator electrically connected to the reference source for lowering the frequency of the reference clock to a predetermined frequency (page 3 [0040]); at least one mixer electrically connected to the local oscillator signal generator (page 2 [0032]) and the receiving circuit for respectively processing the pair of quadrature signals (page 2 [0032]). Wu differs from the claimed invention in not specifically teaching

at least one second calibration device electrically connected to the corresponding mixer for erasing DC offset generated by the mixer. However, Wu teaches at least one second calibration device electrically connected to the corresponding mixer for erasing DC offset generated by the mixer (col. 25 lines 19-22). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Gu for at least one second calibration device electrically connected to the corresponding mixer for erasing DC offset generated by the mixer, such that it provides full integration of the transceiver onto a single IC for a low cost, low power, reliable and more compact solution. This can be achieved by moving external bulky and expensive image reject filters, channel select filters, and baluns onto the RF chip; reducing the number of off-chip passive elements such as capacitors, inductors, and resistors by moving them onto the chip; and integrating all the remaining components onto the chip, as taught by Wu.

Regarding claim 6, Wu further discloses each of the second calibration devices comprises a controllable current mirror, wherein the controllable current mirror is used to transform the pair of quadrature signals into corresponding current signals and to adjust a bias current in an input circuit of the mixer equal to the corresponding current signals for erasing LO leakage generated when the pair of quadrature signals pass the mixer (col. 46 lines 51-67).

7. Claims 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gu (US PUB. 2003/0072393) in view of Darabi et al. (U.S PAT. 6,968,019 hereinafter, "Darabi") as applied to claims above, and further in view of Wu et al. (U.S PAT. 6,987,966 hereinafter, "Wu").

Regarding claim 9, Gu discloses an analog demodulator used in a low-IF receiver, the analog demodulator being an image-rejected analog demodulator with image-rejection capability, the analog demodulator comprising: a receiving circuit for receiving a pair of quadrature IF (intermediate frequency) signals (page 2 [0032]); a reference source for providing a reference clock (page 3 [0040]); a local oscillator signal generator electrically connected to the reference source for transferring the frequency of the reference clock to a predetermined frequency (page 3 [0040]); at least one mixer electrically connected to the local oscillator signal generator (page 2 [0032]). Gu differs from the claimed invention in not specifically teaching a calibration device for processing the pair of quadrature signals. However, Darabi teaches a calibration device for processing the pair of quadrature signals (col. 3 lines 15-30). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Gu for a calibration device for processing the pair of quadrature signals, as per teaching of Darabi, because it provides a low-power, and high performance receiver including an IF demodulator for high data rate, frequency modulated systems, such as Bluetooth. The IF demodulator is implemented in analog domain for simplicity and lower power consumption and operates at an IF

frequency. Gu and Darabi, in combination, fails to discloses a filtering device electrically connected to the local oscillator signal generator for reducing high-order harmonic components generated by the local oscillator signal generator. However, Wu teaches a filtering device electrically connected to the local oscillator signal generator for reducing high-order harmonic components generated by the local oscillator signal generator (col. 25 lines 9-16). Therefore, it is obvious to one of ordinary skill in the art at the time the invention was made to incorporate the disclosing of Wu into view of Gu and Darabi, in order to provide full integration of the transceiver onto a single IC for a low cost, low power, reliable and more compact solution. This can be achieved by moving external bulky and expensive image reject filters, channel select filters, and baluns onto the RF chip; reducing the number of off-chip passive elements such as capacitors, inductors, and resistors by moving them onto the chip; and integrating all the remaining components onto the chip.

Regarding claim 7, Darabi further discloses at least one first calibration device for reducing DC components of the in-phase IF signals and the quadrature-phase IF signals (col. 3 lines 15-30).

Regarding claim 8, Wu further discloses each of the first calibration devices comprises a notch filter or a high pass filter (col. 48 lines 62-63 claim3).

Regarding claim 10, Gu further discloses the image-rejection ability of the analog demodulator relies on whether the quadrature phase difference among four input signals of the local oscillator signal generator is 90 degrees and whether amplitudes of the four input signals of the local oscillator signal generator are the same (page 3 [0037]).

Regarding claim 11, Gu further discloses the filtering device is a poly-phase filter, a low pass filter, or a digital filter (page 3 [0042]).

Conclusion

8. Any response to this action should be mailed to:

Mail Stop_____ (Explanation, e.g., Amendment or After-final, etc.)

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Facsimile responses should be faxed to:

(571) 273-8300

Hand-delivered responses should be brought to:

Customer Service Window

Randolph Building

401 Dulany Street

Alexandria, VA 22313

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan H. Nguyen whose telephone number is (571) 272-8329. The examiner can normally be reached on 8:00Am - 5:00Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Maung Nay A. can be reached on (571) 272-7882. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tuan Nguyen
Examiner
Art Unit 2618

NAY MAUNG
SUPERVISORY PATENT EXAMINER